

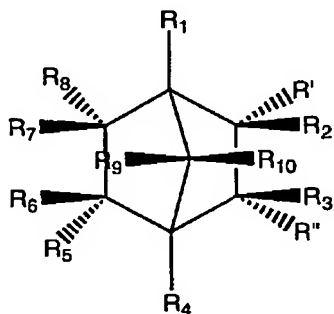
USPTO Customer No. 25280
Serial No: 10/679,217

Inventor(s): Mannion et al
Case No: 5646

IN THE CLAIMS

4. ~~(Currently Amended) An additive thermoplastic formulation additive composition~~
comprising an anti-caking agent and a small size nucleating compound, said
composition at least one anticaking agent further comprising
~~component, and at least one nucleating compound conforming to the structure of~~
Formula (I)

(I)



wherein R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , R_7 , R_8 , R_9 , and R_{10} are independently individually selected from the group consisting of hydrogen, C_1 - C_9 alkyl, hydroxy, C_1 - C_9 alkoxy, C_1 - C_9 alkyleneoxy, amine, and C_1 - C_9 alkylamine, halogen, phenyl, alkylphenyl, and geminal or vicinal carbocyclic having up to nine carbon atoms;

wherein R' and R'' are the same or different and are individually selected from the group consisting of hydrogen, C_1 - C_{30} alkyl, hydroxy, amine, polyamine, polyoxyamine, C_1 - C_{30} alkylamine, phenyl, halogen, C_1 - C_{30} alkoxy, C_1 - C_{30} polyoxyalkyl, and esters: $C(O)-NR_{11}C(O)O-R'''$, and $C(O)O-R'''$, and

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wherein said nucleator compound is provided in the form of particles, said particles

having a D95 size range of less than or equal to about 94 micrometers at a mean

volume diameter (MVD) of about 16; and

wherein said anti-caking agent comprises one or more of a group consisting of: silica

gel; talc, dihydrotalcite; and metal carboxylate acids; and

wherein said anticaking agent is provided in a weight ratio of anticaking agent to

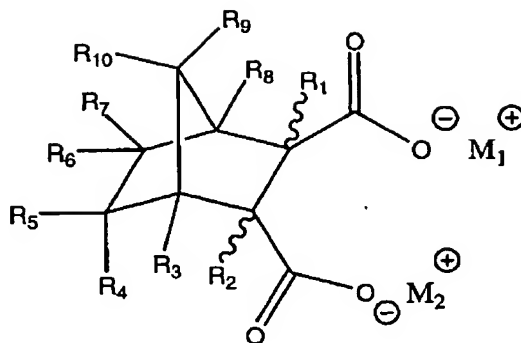
nucleating compound of from about 10:90 to about 30:70.

~~wherein R₁₋₄ is selected from the group consisting of C₁-C₃₀-alkyl, hydrogen, C₁-C₃₀ alkoxy, and C₁-C₃₀ polyoxyalkyl, and wherein R''' is selected from the group consisting of hydrogen, a metal ion (such as, without limitation, Na⁺, K⁺, Li⁺, Ag⁺ and any other monovalent ions), an organic cation (such as ammonium as one non-limiting example), polyoxy-C₂-C₁₈-alkylene, C₁-C₃₀-alkyl, C₁-C₃₀-alkylene, C₁-C₃₀-alkyleneoxy, a steroid moiety (for example, cholesterol), phenyl, polyphenyl, C₁-C₃₀-alkylhalide, and C₁-C₃₀ alkylamino; wherein at least one of R' and R'' is either C(O)-NR₁₋₄, C(O)O-R''' or C(O)O-R''', wherein if both R' and R'' are C(O)O-R''' then R''' both R' and R'' may be combined into a single bivalent metal ion (such as Ca²⁺, as one non-limiting example) or a single trivalent metal overbase (such as Al-OH, for one non-limiting example).~~

2. (Currently Amended) The An additive formulation, of Claim 1 wherein said additive formulation comprises in part an anti-caking agent and a small size nucleating compound, said small size nucleating compound conforming s to the structure of Formula (II)

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wherein M_1 and M_2 are the same or different and are independently selected from the group consisting of metal or organic cations ~~or the two metal ions are unified into a single metal ion (bivalent, for instance, such as calcium, for example), and~~

R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , R_7 , R_8 , R_9 , and R_{10} are independently ~~individually~~ selected from the group consisting of hydrogen, C_1 - C_9 alkyl, hydroxy, C_1 - C_9 alkoxy, C_1 - C_9 alkyleneoxy, amine, and C_1 - C_9 alkylamine, halogen, phenyl, alkylphenyl, and ~~geminal or vicinal C_1 - C_9 carbocyclic having up to 9 carbon atoms. Preferably, the~~

wherein said metal cations are selected from the group consisting of calcium, strontium, barium, magnesium, aluminum, silver, sodium, lithium, rubidium, and potassium, ~~and the like.~~

wherein said nucleator compound is provided in the form of particles, said particles having a D95 size range of less than or equal to about 94 micrometers at a mean volume diameter (MVD) of about 16; and

wherein said anti-caking agent comprises one or more of a group consisting of: silica gel; talc, dihydrotalcite; and metal carboxylate acids; and

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wherein said anticaking agent is provided in a weight ratio of anticaking agent to nucleating compound of from about 10:90 to about 30:70.

3. (Currently Amended) The additive formulation of Claim 2 wherein said metal or organic cation comprises is a metal cation.
~~selected from the group consisting of Group I and Group II metal ions.~~

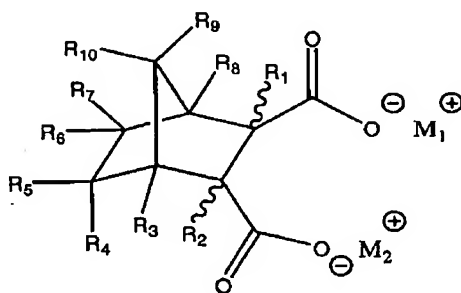
4. (Currently Amended) The additive formulation of Claim 3 wherein said metal cation is calcium. ~~selected from the group consisting of sodium, potassium, calcium, lithium, rubidium, barium, magnesium, and strontium, silver, zinc, aluminum.~~

5. (Currently Amended) The additive formulation of Claim 4 wherein said metal cation comprises is sodium.

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6. (Cancelled) The formulation of Claim 2 wherein said nucleating compound conforms to the structure of Formula (II):



(II)

wherein M_1 and M_2 are the same or different and are independently selected from the group consisting of metal or organic cations or the two metal ions are unified into a single metal ion (bivalent, for instance, such as calcium, for example), and R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , R_7 , R_8 , R_9 , and R_{10} are individually selected from the group consisting of hydrogen, C_1 - C_9 alkyl, hydroxy, C_1 - C_9 alkoxy, C_1 - C_9 alkyleneoxy, amine, and C_1 - C_9 alkylamine, halogen, phenyl, alkylphenyl, and geminal or vicinal carbocyclic having up to 9 carbon atoms.

7. (Cancelled) The formulation of Claim 6 wherein said metal or organic cation is a metal cation

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selected from the group consisting of Group I and Group II metal ions.

8. (Cancelled) The formulation of Claim 7 wherein said metal cation is selected from the group

consisting of sodium, potassium, calcium, lithium, rubidium, barium, magnesium, strontium, silver, zinc, and aluminum.

9. (Cancelled) The formulation of Claim 8 wherein said metal cation is sodium.

10. (Cancelled) The formulation of Claim 1 wherein said anticaking agent is selected from the group consisting of silica gel, talc, dihydrotalcite, metal carboxylic acids, and any mixtures thereof.

11. (Currently Amended) The formulation of Claim 2 ~~10~~ wherein said anticaking agent comprises ~~is~~ a silica gel.

12. (Currently Amended) A thermoplastic article comprising the formulation of Claim ~~4~~ 1, said article further comprising ~~and~~ at least one polyolefin.

13. (Currently Amended) A thermoplastic article comprising the formulation of Claim 2, said article further comprising and at least one polyolefin.

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14. (Currently Amended) A thermoplastic article comprising the formulation of Claim 12, said article further comprising ~~10~~ and at least one polyolefin.

15. (Currently Amended) The thermoplastic article of Claim 13, said article further comprising at least one polyolefin, said ~~12~~ wherein said polyolefin ~~being~~ is a polypropylene.

16. (Currently Amended) The additive formulation of claim 1 wherein said small size nucleating compound comprises disodium bicyclo [2.2.1] heptane-2,3-dicarboxylate. thermoplastic article of Claim ~~15~~ 13 wherein said polyolefin is a polypropylene.

17. (Currently Amended) The additive formulation of claim 11 wherein said small size nucleating compound comprises disodium bicyclo [2.2.1] heptane-2,3-dicarboxylate. The thermoplastic article of Claim ~~14~~ wherein said polyolefin is a polypropylene.

18. (Cancelled) A polymer additive formulation as defined in Claim 1, wherein said formulation is present in a form selected from the group consisting of a powder, a pellet, or a liquid, and wherein said composition also comprises at least one thermoplastic polymer.

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19. (Cancelled) A polymer additive formulation as defined in Claim 2, wherein said formulation is present in a form selected from the group consisting of a powder, a pellet, or a liquid, and wherein said composition also comprises at least one thermoplastic polymer.

20. (Cancelled) A polymer additive formulation as defined in Claim 10, wherein said formulation is present in a form selected from the group consisting of a powder, a pellet, or a liquid, and wherein said composition also comprises at least one thermoplastic polymer.

21. (New) The additive formulation of claim 1 wherein said particles comprise a D95 size of less than or equal to about 10 microns at a mean volume diameter (MVD) of about 7.5.

22. (New) The additive formulation of claim 21 wherein said anticaking agent and small size nucleator compound are provided in a ratio of nucleator compound to anticaking agent of about 80:20.

23. (New) The additive formulation of claim 21 wherein said nucleator compound and anticaking agent are provided in a ratio of nucleator compound to anticaking agent of about 80:20.